

## CARBOLIC ACID GANGRENE OF FINGER.

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CONSIDERING the general use of carbolic acid in surgical antisepsis and its sale at drug stores without a prescription in solutions of all strengths, it is a remarkable fact that there are not more cases of gangrene seen following its indiscriminate use. Those cases which are found are doubtless due to ignorance on the part of the laity in the use of weak and even moderately strong solutions, and on the part of the profession to gross carelessness. I wish to report the following case as an instance of the former practice. This case was observed in the surgical out-patient department of the Polyclinic Hospital, in the clinic of Dr. Francis T. Stewart, to whom I am indebted for permission in reporting this case.

E. W., a woman 27 years old, married. Polyclinic Hospital, Out-patient Department; on records No. 23777; clinic of Dr. F. T. Stewart. Patient's family and previous history negative as far as they could have any bearing on the condition reported. First observed Feb. 24, 1908. The patient stated that on Feb. 21, 1908, she punctured her index finger with a small splinter of wood, which was removed immediately. The following day the finger began to swell so that last evening, Feb. 23, 1908, she applied to the finger a cloth saturated with a weak solution of carbolic acid of unknown strength, which she had obtained at a drug store. This dressing remained in place from 11 P.M. until 4 A.M. the next morning. It was removed on account of the pain in the finger. The dressing had become dry. She then noticed that the finger was numb, cold, discolored and dry, and at the base of the finger there was a distinct line of demarcation, and at this region there was intense pain present. When first seen by the writer the finger presented the following conditions: the terminal half of the left index finger was bluish white in color, which

extended on the flexor surface to the middle of the proximal phalanx, and on the extensor surface to the first interphalangeal joint. At the tip of the finger there is a blister containing serum, slightly blood-tinged. The skin over this blister is yellowish-blue. To the proximal side of the line of demarcation, the finger is swollen, red, very tense, and painful on pressure. This redness gradually fades to the normal color of the skin as the base of the finger is reached. Complete, superficial, and deep anæsthesia of the involved portion of the finger is present. On puncture with a needle in the involved area the tissue of the finger is found to be dry excepting in the region of the blister above mentioned. The patient was advised to have the finger amputated, but refused. A dressing of boric acid ointment was then applied with the understanding that the patient would return in two days for amputation if the condition had not improved. The patient failed to return to the clinic, but went to another hospital two days later and then the finger was amputated at the metatarsophalangeal joint.

Figs. 1 and 2 show the flexor and extensor aspect of the involved finger.

That the condition is not a rare one may readily be seen from the reported cases in the literature. Honsell in 1897 reported 48 cases; Von Bergmann states that in 61 cases collected, the strength of the solution used was 1 to 5 per cent. in 30 cases, and concentrated in 31 cases; Kortüm reports that he has observed gangrene following the use of moderately concentrated solutions of carbolic acid, in three to four hours; Von Bruns and Peraire report cases in which gangrene followed the use of a 1 per cent. solution for 24 hours; and Levai cites cases in which a 2 per cent. solution applied for 12 hours produced gangrene.

Kortüm regards the cause as neuropathic. Frankenberg states that "the epidermis is destroyed; the submucous tissue shows considerable transudation, and the contents of the lymph- and blood-vessels are coagulated. Gangrene follows the thrombosis of the vessels."

Levai and Honsell made a series of experiments and arrived at the conclusion that "it is very probable that the

FIG. 1.



Carbolie acid gangrene of finger. Flexor surface of hand.

FIG. 2.



Carbolic acid gangrene of finger. Extensor surface of hand.

action of carbolic acid is not a specific one, but is analogous to that produced by mineral acids."

Von Bergmann states, "Individual disposition probably plays a certain part, as I remember in my experience, during the period when carbolic acid was still used in the treatment of wounds; and a difference in toleration was noticed."

The author is inclined to consider that in the use of weak solutions of carbolic acid there is not a primary destruction of the epidermis, as Frankenberger states, but that the primary changes are of a neuropathic character; this is followed by a slowing of the blood current in the part affected, with transudation of the elements of the blood, and that, following the blocking of the blood and lymphatic system, coagulation takes place as a specific result of the action of the carbolic acid, which necessarily becomes stronger in character as the watery elements of the solution disappear through evaporation.

In the treatment of this condition one should not hastily advise amputation. Very often only a superficial necrosis of the part is produced, and by conservative treatment the part may be saved, and the necrosed area covered by skin-grafting. When the part has become dry, and bluish-black in color, and it is evident that complete gangrene has taken place in the part, then, and only then, should amputation or exarticulation be performed above the line of demarcation.